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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,449	01/19/2007	Akira Takaguchi	1082/HIROSE	2452
27649	7590	03/16/2010	EXAMINER	
MICHAEL TOBIAS 1629 K ST NW SUITE 300 WASHINGTON, DC 20006			MEHTA, MEGHA S	
			ART UNIT	PAPER NUMBER
			1793	
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			03/16/2010	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,449	<b>Applicant(s)</b> TAKAGUCHI ET AL.	
	<b>Examiner</b> MEGHA MEHTA	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 October 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 62-259665 Kabe in view of WO03/048579 Gerstenberg (refer to US 7,165,933 for translation).

Regarding claim 9, Kabe teaches a wave soldering tank **2** comprising a soldering tank body for housing molten solder **8**, a solder feed chamber disposed within the soldering tank body and having an inlet disposed below the level of molten solder and an outlet disposed above the level of molten solder in the soldering tank body and a screw-type pump **23** disposed in the inlet so as to draw molten solder into the solder feed chamber through the inlet and discharge molten solder through the outlet (figure 1 and abstract).

Kabe does not teach a multiple blade screw.

Gerstenberg teaches a multiple-blade screw-type pump (column 3, lines 63-67) enclosed in a casing that is used to transport a viscous liquid. While Gerstenberg's apparatus is outside Kabe's field of endeavor, it is analogous because both use screw pumps enclosed in cylindrical casings for forcing a viscous liquid through a pump to move it from one location to another. "Thus a reference in a field different from that of applicant's endeavor may be reasonably pertinent if it is one which, because of the matter with which it deals, logically would have

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commended itself to an inventor's attention in considering his or her invention as a whole," (MPEP 2141.01 Section I).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the multiple-blade screw pump of Gerstenberg in the method of Kabe because the multiple-blade pump more efficiently and effectively transports the viscous liquid than would a single-blade pump.

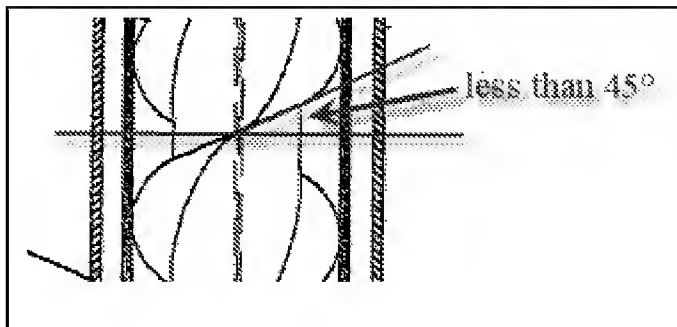
Regarding claim 10, Kabe in view of Gerstenberg teaches that the pump includes an impeller comprising a rotatable hub and a plurality of helical blades secured to the hub at equal intervals in the circumferential direction of the hub (Kabe figure 2 and abstract, Gerstenberg column 3, lines 63-67).

Regarding claim 11, Gerstenberg teaches that each of the blades overlaps an adjoining one of the blades when the blades are viewed in the axial direction of the impeller (figure 1).

Regarding claim 12, Gerstenberg teaches that the impeller comprises four helical blades provided at equal intervals in the circumferential direction of the hub (column 3, line 63 -- column 4, line 4), each blade extending around the hub by at least  $120^\circ$  between first and second ends of the blade (figure 1).

Regarding claim 13, Gerstenberg teaches that each of the blades is sloped by at most  $45^\circ$  with respect to a plane perpendicular to a rotational axis of the hub (shown in figure 1 to the right).

Regarding claim 14, Kabe teaches that the solder feed chamber comprises a



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partition **6** which divides the interior of the soldering tank body into an upper and lower portion, the inlet comprises an opening formed in the partition (figure 1), and the pump includes an impeller and a cylindrical casing disposed in the inlet and surrounding the impeller, the impeller being rotatably disposed in the casing so as to transport molten solder in an axial direction of the casing (figure 2).

Regarding claim 15, Kabe teaches that the solder feed chamber includes a duct which extends upwards from the partition and a nozzle disposed at an upper end of the duct and extending above the surface of molten solder in the soldering tank body (figure 1).

Regarding claim 16, Kabe teaches that a lower end of the impeller extends below a lower end of the casing (figure 2). Kabe does not explicitly teach the extension amount. However, it would have been within the purview of one of ordinary skill in the art at the time of the invention to decide how far the lower end should extend based on the desired flow path and bath dimensions.

Regarding claim 17, Gerstenberg teaches a clearance between the casing and the impeller is 0.1-1mm (column 4, lines 22-25).

Regarding claims 18 and 19, Gerstenberg teaches that the pump has at least 4 helical blades (column 3, lines 63-67), and each of the blades overlaps an adjoining one of the blades when the blades are viewed in the axial direction of the pump (figure 1).

Regarding claim 20, some of the limitations are taught above with regard to claims 9 and 14. Kabe further teaches a horizontal partition **6** extending across the tank body below the level of molten solder in the tank body, the partition having first and second openings horizontally spaced from each other, a bowl-shaped guide secured to a lower side of the partition and having

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curved surfaces for guiding fluid beneath the first and second openings, a nozzle having a lower end in fluid communication with the second opening in the partition, the pump having an impeller disposed so as to draw molted solder downwards through the first opening into a space between the partition and the bowl-shaped guide (figure 1).

Regarding claim 21, Kabe teaches that the impeller is disposed in the first opening of the partition (figure 1).

Regarding claim 22, Gerstenberg teaches that the impeller includes at least four helical blades (column 3, line 63 -- column 4, line 4).

Regarding claim 23, Kabe teaches a duct extending upwards from the partition above the second opening and communicating between the second opening and the lower end of the nozzle (figure 1).

Regarding claim 24, Kabe teaches that there are no obstructions to flow of fluid between the first opening and the lower end of the nozzle (figure 1).

Regarding claim 25, Kabe in view of Gerstenberg teaches most of the limitations with respect to claims 20 and 19 above. Kabe further teaches that the blades are disposed in the tank body below the level of molten solder in the tank body and a casing surrounding the impeller and fluidly communicating with the lower end of the nozzle along an unobstructed flow path (figure 1).

### ***Response to Arguments***

3. Applicant's arguments with respect to JP 2-205257 and US 2004/0211816 Ogawa have been considered but are moot in view of the new ground(s) of rejection.

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4. Applicant's arguments filed October 5, 2009, have been fully considered but they are not persuasive.

Applicant argues that Kabe and Gerstenberg are not analogous references because the emulsion of Gerstenberg is an entirely different material from that of Kabe. However, as explained above, these references are analogous because they are both using screw pumps enclosed in cylindrical casings for forcing a viscous liquid through a pump to move it from one location to another.

5. Applicant's arguments filed November 23, 2009, have been fully considered but they are not persuasive.

Applicant argues that JP 62-259665 does not teach a multiple blade pump. The Examiner agrees and therefore has withdrawn the 102 rejection of Kabe.

Applicant argues that Kabe and Gerstenberg are non-analogous references. However, as explained above, the references are analogous because they are both pumps used to force a viscous liquid from one place to another. The Examiner agrees that at first look, the references may not appear to be analogous, but when one examines the details of each invention, it is clear that the pumps are being used for the same purpose; therefore they solve the same problem and are analogous.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEGHA MEHTA whose telephone number is (571)270-3598. The examiner can normally be reached on Monday to Friday 7:30 am to 5:00 pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Megha Mehta/  
Examiner, Art Unit 1793

/Jessica L. Ward/  
Supervisory Patent Examiner, Art Unit 1793